eleven of bear, one of a small rodent, one jaw of fox, numerous bones and fragments of bone, of which six had been charred and a greater number gnawed, a large number of coprolites, and seven tools, flakes, and chips of flint, in the Cave Earth; 213 teeth of bear, some of them in jaws or pieces of jaws, two of lion, in parts of upper jaw, and twenty implements and flakes of flint and chert.

The Recess.—On completing the exploration of the Cave of Inscriptions, operations were at once commenced in a "Recess" occupying its north-western corner, and which was expected to lead to a new external entrance to the cavern. It extends in a north-westerly direction for fully sixty feet, and is of sufficient width for a man to pass easily; beyond this its extent is considerable, but at present it is too narrow for examination. Its floor is a thick sheet of the crystalline or more ancient stalagmite, and is abruptly truncated at the junction of the Recess with the Cave of Inscriptions. It rested on a thick mechanical accumulation, which is unmistakeable breccia, and reaches a higher level than elsewhere in the cavern, so far as is at present known. It was decided to leave intact the Stalagmitic Floor, and in fact to burrow under it; but when the excavation had reached a distance of ten feet, the two walls were found to be so very nearly together as to render it necessary to abandon the work, or to break up the floor and proceed at a higher level. The former course was, though reluctantly, decided on. The only specimens found here were two teeth of bear, a few bones, and an unimportant piece of flint.

The Alcove.—A recess in the eastern wall of the Cave of Inscriptions, near the Hedges Boss, and which received the name of the "Alcove," was next explored. When emptied it proved to be scarcely lofty enough for a man to stand erect, and ten feet in length and breadth, but divided into two compartments by a limestone partition extending nearly across it. Its exploration, which occupied three weeks, was rewarded with thirty-nine "finds" of remains of mammals, including fifty-nine teeth of bear, several of them in portions of jaws; sixteen of fox, all of them in portions of three lower jaws; four of hyæna; numerous bones, including several good specimens, though all of them more or less fragmentary; and one coprolite. The teeth of hyæna, two of the jaws of fox, and the coprolite were met with in cave earth; but the remaining jaw of fox (No. 6,619) was found in the breccia. It was broken into two pieces, which were lying together and contained five teeth, and is the only known relic of the genus in this old deposit. The Alcove contained no trace of flint or chert.

The Great Oven.—A very long, narrow, and low tunnel opening out of the south-western corner of the Cave of Inscriptions has been termed the "Great Oven." Its exploration was begun July 27, 1875, or but four days before the period at which this report closes. It contains a thin layer of cave earth, and a deposit of breccia of unknown depth. The former has already yielded a few traces of hyæna, and the latter a greater number of ursine remains.

On studying the osseous remains found in the Breccia in the branches of the cavern explored during the last twelve months, the following prominent facts arrest attention:—Some of the teeth of bear are those of very old animals and worn almost to the fang. The jaws, though frequently broken, have never lost their lower borders, as is almost uniformly the case with the cave-earth specimens; and none of the bones appear to have been gnawed. In no instance were the bones found lying in their anatomical relations, but different parts of the skeleton were often huddled confusedly together; thus, in No. 6,613, found in the Alcove, a canine tooth adheres to one side of the proximal end of a tibia, and a piece of jaw to another side. Some of the specimens have fretted surfaces, and appear to have been rolled by running water. Many of the bones were broken where they were finally lodged, and the parts, with little or no displacement, reunited with stalagmitic infiltration. Others appear to have been flattened, or more or less crushed, where they lay. Occasionally, in the same rock-like mass of breccia were found bones of very different colours, showing that mere colour is no test of age.

Nor are the remains from the cave earth void of instruction. Up to the present time, wherever the cave earth has been met with, there also have traces of the hyæna been found, either in the form of parts of his skeleton, or his coprolites, or bones scored with his teeth-marks, or jaws divested of their lower borders, or long bones broken after his well-known fashion. But though everywhere present in greater or lesser numbers, these traces became less and less plentiful with increased distance from the external entrances of the cavern, and were very "few and far between" in the chamber most remote from the entrances. Whilst remains of the hyæna were thus met with wherever the cave earth occurred, they were accompanied in the interior by very few of his contemporaries. Thus, whilst the chambers adjacent to the entrances contained teeth and bones of horse, rhinoceros, deer (several species), bear, fox, elephant, ox, lion, wolf, and hare, as well as hyæna—the last being by far the most prevalent—remains of the hyæna alone have been found during the last twelve months. Nor is it without interest to note the branches of the cavern in which remains of the different forms just enumerated were last detected on the way to the Cave of Inscriptions. The hare was not found anywhere in the western division of the cavern—that of which the Cave of Inscriptions is the innermost chamber; the badger, wolf, and ox were represented in the "Charcoal Cave," but not beyond it; and relics of horse, rhinoceros, deer, bear, fox, elephant, and lion did not appear beyond the Long Arcade. Finally, no traces of Machairodus have been met with since the incisor tooth, found July 29, 1872, and described in the Eighth Report, presented at Brighton.

SCIENTIFIC SERIALS

Proceedings of the Berwickshire Naturalists' Field Club, vol. vii. No. ii.—This earliest of Field Clubs continues to sustain the high reputation it has had from the beginning; the present part of the Proceedings shows that the members continue to investigate diligently and to good purpose the natural history and antiquities of the interesting district which forms their field. Most of the papers are of real value, and the best service we can render the club and our readers is to give a list of them:—"On supposed lake or river-terraces near Kelso," by Mr. T. Craig; "On Jedburgh Pears," by Mr. James Tate; "On the antiquity and history of some Border Pears," by Mr. Jas. Hardy; "On evidences of ice-action in Berwickshire," by Mr. W. Stevenson; "Ornithological notes," by Mr. H. Gibb; "On the value of the horse-chestnut (*Æsculus hippocastanum*) as a timber-tree in plantations," by Mr. R. Carr-Ellison; "On Lepidoptera, taken mostly in 1874," a list of captures by various members; "On the signification of some names of places in South Northumberland," by Mr. R. Carr-Ellison; "On the occurrence of the Wild Cat in the border district," by Mr. James Hardy; "A list of local plants and their localities," by Mr. A. Brotherston; "Ornithological notes," by Mr. R. Gray; "On iron and iron slag found at Worm Law and Yeavering," by Mr. Jas. Hardy; "On some flint implements of prehistoric people in Berwickshire,' by Mr. James Hardy, with some beautifully executed illustrations; "A note on a specimen of *Arabis turrita*, discovered at Haining," by Mr. A. H. Borthwick; "On ancient stone cysts and human remains discovered at Aycliffe House, near Ayton," by Mr. J. Hardy, with an illustration; "On a bronze celt found at Linden," by Mr. R. G. Balam, with an illustration; "Some notes on the movements of migratory birds," by Dr. Scott and Mr. Hardy; "Zoological notes," by Messrs. Ferguson and Brotherston; various information on local natural history, by Mr. Hardy; "On some of the birds of Lauderdale," by Mr. A. Kelly; "List of *Araneidea* and *Phalangidea*, collected from Oct. 1871 to Dec. 1874, in Berwickshire and Northumberland, by Mr. James Hardy," by the Rev. O. P. Cambridge; "On Berwickshire insects," by Mr. Hardy, who also has "Contributions to the entomology of the Cheviot Hills."

Third Report of the Winchester College Natural History Society.—This report is altogether very encouraging; it has, as the preface justly states, "a real amount of active and intelligent life" to record during the year. The members as a body seem to be really interested in the work of the Society, and the tendency of that work is evidently to train the members to be accurate observers and independent thinkers. In the preface considerable importance is rightly attached to the collection and exhibition of specimens at the meetings for examination and comment, especially with the view of encouraging the younger members to become intelligent collectors. The report contains a considerable number of papers, nearly all by present or past members, and these papers give evidence of real intelligence, honest study, and in some cases of original observation. The first paper especially, that by W. A. Forbes, is highly creditable to its author; G. L. Hawker's, on Bio-geology, shows considerable knowledge and not a little originality of conception; the paper by N. M. Richardson also deserves mention. But indeed

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the papers as a whole are above the average of those emanating from similar societies. The lists of specimens in the various sections appended show that the members continue to do much practical work; a botanical garden has also been opened in connection with the Society.

Proceedings of the Bath Natural History and Antiquarian Field Club, vol. iii. No. 2, 1875.—This part contains the following papers on scientific subjects:—Notes on some railway sections near Bath, by the Rev. H. H. Winwood, F.G.S., with an illustration.—Studies and problems for Somersetshire geologists, by M. H. B. Woodward, F.G.S.—There is an interesting address by the Rev. Preb. Scarth, on the results of modern archæological achievement, and a summary of Proceedings for the year 1874–75, by the Secretary.

Morphologisches Jahrbuch.—The first part of this new Journal of Anatomy and Embryology, issued by Prof. Gegenbaur (see vol. xii. p. 15) consists of about 200 pages, and has five double plates. Prof. Gegenbaur supplies an excellent introductory article on the position and signification of morphology. The succeeding sixty pages are occupied by an elaborate account, by Dr. Richard Hertwig, of *Podophrya gemmipara*, a new species of Acinetan, followed by an essay on the structure and systematic position of the Acinetæ. The author identifies his species with one figured, but not determined, by the late Mr. Alder in the "Annals of Natural History" for 1851, p. 426. Its nucleus is remarkable for having a number of irregular stellate branches, and its tentacles are differentiated into captorial and suctorial. After a review of the structure of Acinetæ generally, Dr. Hertwig comes to the conclusion that a unicellular organism, covered with cilia, is the original form from which Acinetæ and Infusorians have sprung, but that it cannot yet be determined whether it possessed a cytostome, and thus was a true ciliated Infusorian, or whether it was provided with tentacles, and was intermediate between Ciliata and Acinetæ.—The whole of the remainder (114 pages) of this part is occupied by a very notable paper by Dr. Emil Rosenberg, on the development of the vertebral column and of the os centrale carpi of man. He sets before himself the problem, little touched hitherto, of the discovery of the steps by which man may have developed from the nearest mammalian stock. Taking first the vertebral column, he sets forth the differences existing therein in the various Anthropomorphæ, and seeks to reconcile them with that of man. For instance, in two genera, Troglodytes and Hylobates, there are thirteen dorsal vertebræ, while in the Orang and in man there are only twelve. But Dr. Rosenberg has discovered in more than one human embryo an actual rib-rudiment on the 13th dorsal vertebra; so that the homology of the 13th dorsal in man and Troglodytes is established. Another result that Dr. Rosenberg claims to have demonstrated from examination of human embryos is that a process of transformation goes on in the growth of the sacrum, by which vertebræ at the proximal end, with their costal elements, are assumed into the sacrum, while a corresponding number at the distal end undergo reduction and are dismissd into the caudal region. And this process, generalised, may be applied to each of the hinder regions of the vertebral columns. Thus in the history of development each lumbar vertebra in man is the result of a single transformation from the condition of a dorsal vertebra; each sacral vertebra has previously passed through the lumbar stage; while the caudal vertebræ have been successively dorsal, lumbar, and sacral, before becoming caudal. This is necessarily but a very imperfect sketch of the major subject of this paper, which is of very high interest.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, Oct. 26.—M. Frémy in the chair.—In opening, he referred in feeling terms to the death of Sir Chas. Wheatstone.—M. Milne-Edwards presented the second part of the eleventh vol. of his work on "The Comparative Physiology and Anatomy of Men and Animals." The following other communications were made:—On employment of means in experimental physiology, *àpropos* of the influence of stripping the leaves off the beet, upon the production of saccharine matter, by M. Cl. Bernard. M. Frémy made some remarks also on this subject.—On the carpellary theory, according to the Irideæ (third part), by M. Trécul.—On the dates of fall of meteorites, by M. Sainte-Claire Deville. He finds an excessive fall of bodies on the 12th, 13th, and 14th May; also something like a ten-days' period, corresponding to periodical inequalities of temperature.—On the practical value of steam-injectors, by M. Ledieu.—Progress realised, in the question of making land, by employment of the rational method, and in determination of the daily working of chronometers, by M. de Magnac. The new method (he shows) renders navigation much more exact.—Magnetic observations on the island of St. Paul, in November and December 1874, by M. Cazin.—On the mosses of St. Paul and Amsterdam Islands, by M. Bescherelle.—List of Lichens collected by M. de l'Isle, on St. Paul and Amsterdam, and description of new species, by M. Nylander.—New spectro-electric tube (modified fulgurator), by MM. Delachanal and Mermet. A small conical capillary tube is placed over the platinum electrode passing through the bottom of the larger tube; through this the liquid rises and is illuminated by the spark.—On the laws which govern reaction with direct addition (continued), by M. Markovnikoff.—The industry of nitrate of soda in South America, by M. L'Olivier.—Experimental researches on the mechanism of coagulation of blood in treatment of varices by simple isolation of veins, by M. Bergeron.—On the alterations produced in the vine by *Phylloxera vastatrix*, by M. Max. Cornu.—Conservation of food stuffs, by M. Reynoss.—M. de Carvalho presented a note on the properties of air subjected to passage of an induction current.—M. Delauney on a "solar concentrator," *àpropos* of M. Mouchot's paper.—M. Pertinset on a project of exploration of Terra del Fuego.—The Minister for the Navy and Colonies communicated part of a report from the Governor of Martinique on the earthquake there from 17th to 25th September, and magnetic phenomena accompanying it. M. Sainte-Claire Deville said M. Duvignan had written him from Guadeloupe that none of the Martinique shocks had been felt there.—Observations of the planet (149) discovered by M. Perrotin at Toulouse (sent by M. Leverrier).—Experiments made on Geissler tubes with the chloride of silver pile formerly described, by MM. Warren De la Rue and Müller.—On spiral nebulæ, by M. Planté. He shows how a cloud of metallic matter detached from the electrode by an electric current of high tension, in a liquid, assumes a gyratory movement when acted on by a magnet; and supposes the form of spiral nebulæ may thus be due to strongly magnetic celestial bodies in their neighbourhood.—On the hydrological map of the department of Seine-et-Marne, by M. Delesse.—M. Degantière presented a note on the noise which accompanies or precedes the fall of hail.

BOOKS AND PAMPHLETS RECEIVED

COLONIAL.—Report of the Agricultural Conditions, Capabilities, and Prospects of the Neilgherry District: W. R. Robertson, M.R.A.C. (Madras).

AMERICAN.—The Mechanical Engineer; his Preparation and his Work. An Address by R. H. Thurston, A.M., C.E. (New York, Van Nostrand).—Monthly Report of the U.S. Department of Agriculture, Aug. and Sept.—Memoirs of the Boston Society of Natural History. Vol. ii. Part 4, No. 2.—Report of Mount St. Elias: W. H. Dall, W.S.C.S.—Bulletin of the Buffalo Society of Natural Sciences.

FOREIGN.—Bulletin de la Fédération des Sociétés d'Horticulture de Belgique (Liége).—Liste des Jardines, des Chaires, et des Musées Botaniques du Monde (Liége).

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ERRATUM.—Vol. xii. p. 559, col. 2, line 17 from bottom; for "sixty years" read "ten years."

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